(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 559 503 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
03.08.2005 Bulletin 2005/31

(51) Int Cl.[7]: **B23Q 7/03**, B23Q 7/05

(21) Application number: **05001408.3**

(22) Date of filing: **25.01.2005**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR LV MK YU

(30) Priority: **28.01.2004 IT MI20040120**

(71) Applicant: **RE.M. S.r.l.**
22060 Perticato di Mariano Comense (CO) (IT)

(72) Inventor: **Reguzzi, Luigi**
22060 Perticato di Mariano Comense Como (IT)

(74) Representative: **Cicogna, Franco**
Ufficio Internazionale Brevetti
Dott.Prof. Franco Cicogna
Via Visconti di Modrone, 14/A
20122 Milano (IT)

(54) Driving assembly for driving panels and plate elements to processing stations

(57) A driving assembly for driving panels and plate elements in general to be processed comprises a central framework for supporting a driving chain continuously entrained on a driving pulley and an idle pulley, a plurality of panel driving shoes being coupled to the chain.

The main feature of the invention is that the driving assembly further comprises, on a portion of an active arm of the driving chain, actuator elements for removing the drive shoes from a panel sliding plane, to allow a processing tool to perform a lot of desired machining operations on the panels.

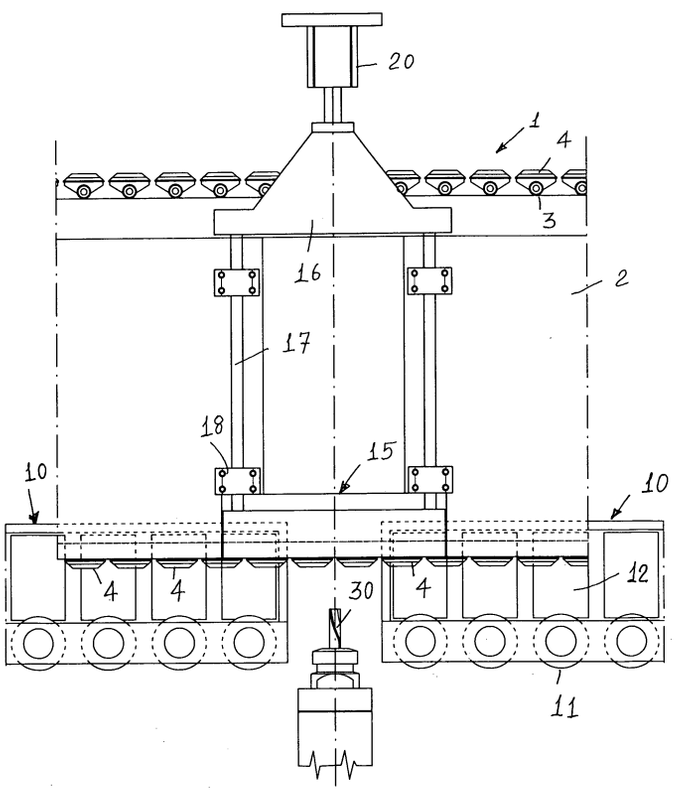

FIG.1

EP 1 559 503 A1

Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a driving assembly for driving or conveying panels and plate-like elements in general to be processed or machined.

[0002] Different types of driving assemblies for conveying panels and plate-like elements in general to be processed, which are usually arranged on a vertically extending plane, are already known.

[0003] Said prior driving assemblies conventionally comprise a driving chain supporting driving shoe elements for driving and conveying the plate-like element.

[0004] However, prior driving assemblies do not allow to proper machine panels, since the working tools, which can comprise milling tools, perforating bits and the like, would interfere against the driving shoes.

[0005] Accordingly, it is necessary to remove the panel from its driving assembly, to perform the desired machining operations, and then relocate said panel on the driving assembly.

[0006] Thus, the above processing method requires a very long machining time, with an inevitable increase of the panel processing cost.

SUMMARY OF THE INVENTION

[0007] Accordingly, the aim of the present invention is to overcome the above mentioned problem, by providing a panel and plate-like element driving or conveying assembly, for conveying a plurality of panels or plate elements to processing stations, which is specifically adapted to allow contouring, drilling and cutting operations to be performed on said panels, without the need of removing the panels from the driving assembly.

[0008] Within the scope of the above mentioned aim, a main object of the present invention is to provide such a panel driving assembly, in which the panels being processed can be firmly clamped on said driving assembly, during the machining operations, thereby greatly simplifying all the panel handling operations.

[0009] Another object of the present invention is to provide such a panel driving assembly which is very reliable and safe in operation.

[0010] Yet another object of the present invention is to provide such a panel and plate-like element driving assembly which can be easily made starting from easily available elements and materials, and which, moreover, is very competitive from a mere economic standpoint.

[0011] According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a driving assembly for driving panels and plate elements in general to be machined, comprising a central supporting framework supporting a driving chain continuously entrained on a driving pulley and an idle pulley, a plurality of driving shoe being coupled to said driving chain for driving said panels, and being characterized in that said driving assembly further comprises, on a portion of an active branch of said driving chain, actuator means for removing said driving shoes from a sliding plane of said panels, to allow a machining tool to perform on said panels set machining operations.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Further characteristics and advantages of the present invention will become more apparent hereinafter from the following detailed disclosure of a preferred, though not exclusive, embodiment of a driving assembly for driving or conveying panels and plate elements in general to be machined, which is illustrated, by way of an indicative, but not limitative, example, in the accompanying drawings, where:

Figure 1 is a schematic top plan view illustrating the driving assembly according to the present invention, in an inoperative or rest position thereof;

Figure 2 is a further top plan view illustrating the driving assembly during a panel driving or conveying operation;

Figure 3 is a further schematic top plan view illustrating the driving assembly during a panel machining or processing operation;

Figure 4 is a schematic perspective view illustrating a detail of a region thereat actuator means are arranged; and

Figure 5 is a further perspective view illustrating the driving shoe elements in a position thereof removed from the panel sliding plane.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] With reference to the number references of the above mentioned figures, the driving assembly for driving or conveying panels and plate-like elements in general, according to the present invention, which has been generally indicated by the reference number 1, comprises a central supporting framework 2, which supports a driving chain 3 which is continuously entrained on a driving pulley and an idle pulley, not specifically shown in the drawings.

[0014] The driving chain 3 comprises a plurality of chain links, to which a plurality of driving shoes 4 are coupled, said driving shoes having preferably a rubberized surface for engaging or gripping a panel to be processed.

[0015] The driving assembly comprises, in particular, an active branch, on which the panel is conveyed, said active branch including a plurality of clamping elements 10.

[0016] Said clamping elements 10 support corresponding vertical axis rubberized roller elements 11, en-

gaging with a face of the panel, and further rubberized rollers 12, of horizontal axis, in turn engaging the edges of the panels being conveyed.

[0017] More specifically, the clamping elements 10 are so designed as to press the panel against the shoe elements to cause said panel to be frontward fed, since the shoe elements, driven by the driving chain, can be easily displaced in both directions.

[0018] The main feature of the invention is that, at a portion of the active branch of the driving chain, between two clamping elements 10, a portion is provided including a plurality of actuator elements, generally indicated by the reference number 15, designed for moving away two or more driving shoes 4, i.e. for removing said shoe elements from the sliding plane of the panels, generally indicated by the reference P.

[0019] To perform the removing or moving away operation, the actuator means comprises a frame 16 including a plurality of sliding column elements 17, which can slide in sliding guides 18 which are connected to one another at a portion opposite to the active branch and which are coupled to an actuator 20, provided for driving the frame 16 with a consequent displacement of the guides of the driving chain which, as is clearly shown in figures 3 and 5, will remove the driving shoes from the panel sliding plane.

[0020] In the region included between the two clamping elements 10 is moreover provided a machining tool, generally indicated by the reference number 30, which, the driving shoes being arranged in a removed position, can perform the required machining operations on the panel, without interfering against the driving shoes which would be arranged, as stated, at a withdrawn position.

[0021] The machining tool can be a drilling tool, a cutting tool, a contouring tool specifically designed for contouring the panels or for performing any other desired machining operations thereon.

[0022] From the above disclosure it should be apparent that the invention fully achieves the intended aim and objects.

[0023] In fact, the invention provides a driving assembly, which allows the panels to be directly machined on the driving assembly itself, since some driving shoes are withdrawn from the panel plane at the machining tool.

[0024] The invention, as disclosed, is susceptible to several modifications and variations, all of which will come within the scope of the invention.

[0025] Moreover, all the constructional details can be replaced by other technically equivalent elements.

[0026] In practicing the invention, the used materials, as well as the contingent size and shapes, can be any, depending on requirements.

Claims

1. A driving assembly for driving panels and plate elements in general to be machined, comprising a central supporting framework supporting a driving chain continuously entrained on a driving pulley and an idle pulley, a plurality of driving shoe being coupled to said driving chain for driving said panels, and being **characterized in that** said driving assembly further comprises, on a portion of an active branch of said driving chain, actuator means for removing said driving shoes from a sliding plane of said panels, to allow a machining tool to perform on said panels set machining operations.

2. A driving assembly, according to the preceding claim, **characterized in that** said driving assembly comprises clamping elements for coupling said panels to said driving shoes.

3. A driving assembly, according to claim 2, **characterized in that** said clamping elements comprise a plurality of vertical rollers engageable with a surface of the panels being driven, and further horizontal rollers designed for engaging a bottom edge of said panels.

4. A driving assembly, according to claim 1, **characterized in that** said active branch where said actuator means are arranged is provided between two mutually spaced clamping elements.

5. A driving assembly, according to claim 1, **characterized in that** said actuator means comprise a frame including a plurality of sliding column elements designed for sliding in guide blocks and being connected, at an opposite portion from said active branch, to an actuator for driving said frame, said frame operating on guide elements of said driving chain for removing at least one of said shoes.

6. A driving assembly, according to claim 1, **characterized in that** said driving shoes have a rubberized surface.

7. A driving assembly, according to claim 1, **characterized in that** said driving chain is adapted to be driven in both directions.

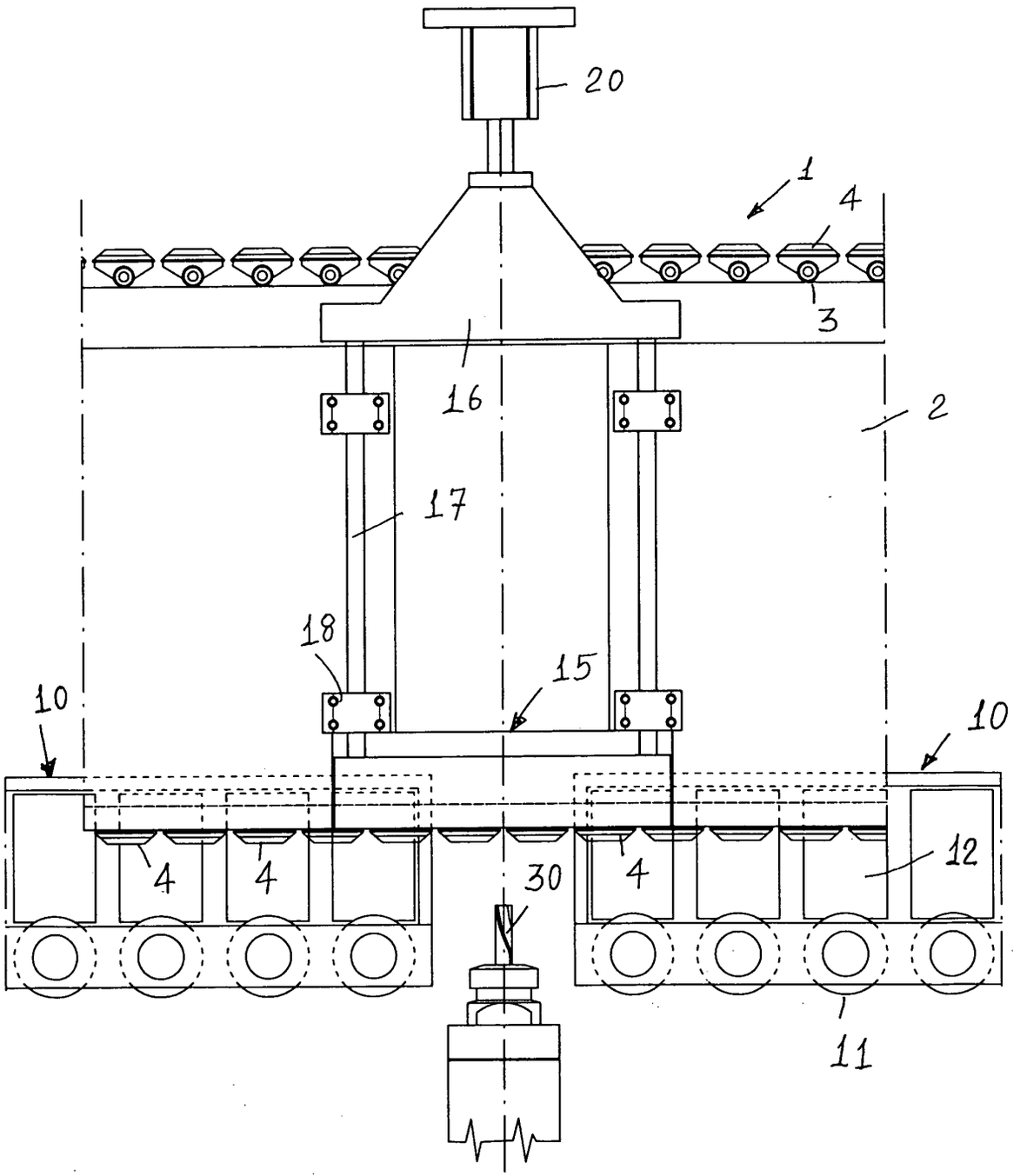

FIG. 1

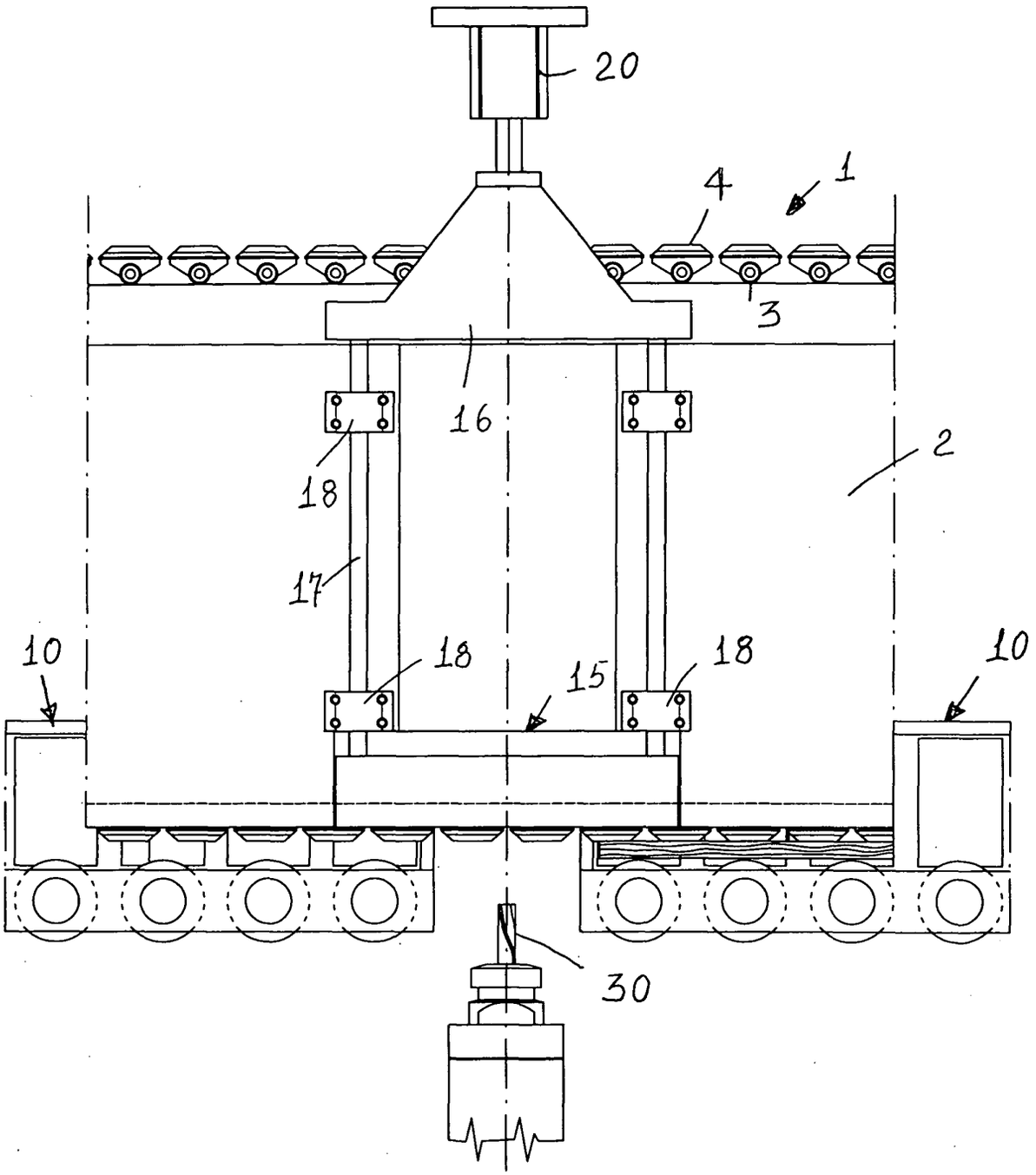

FIG. 2

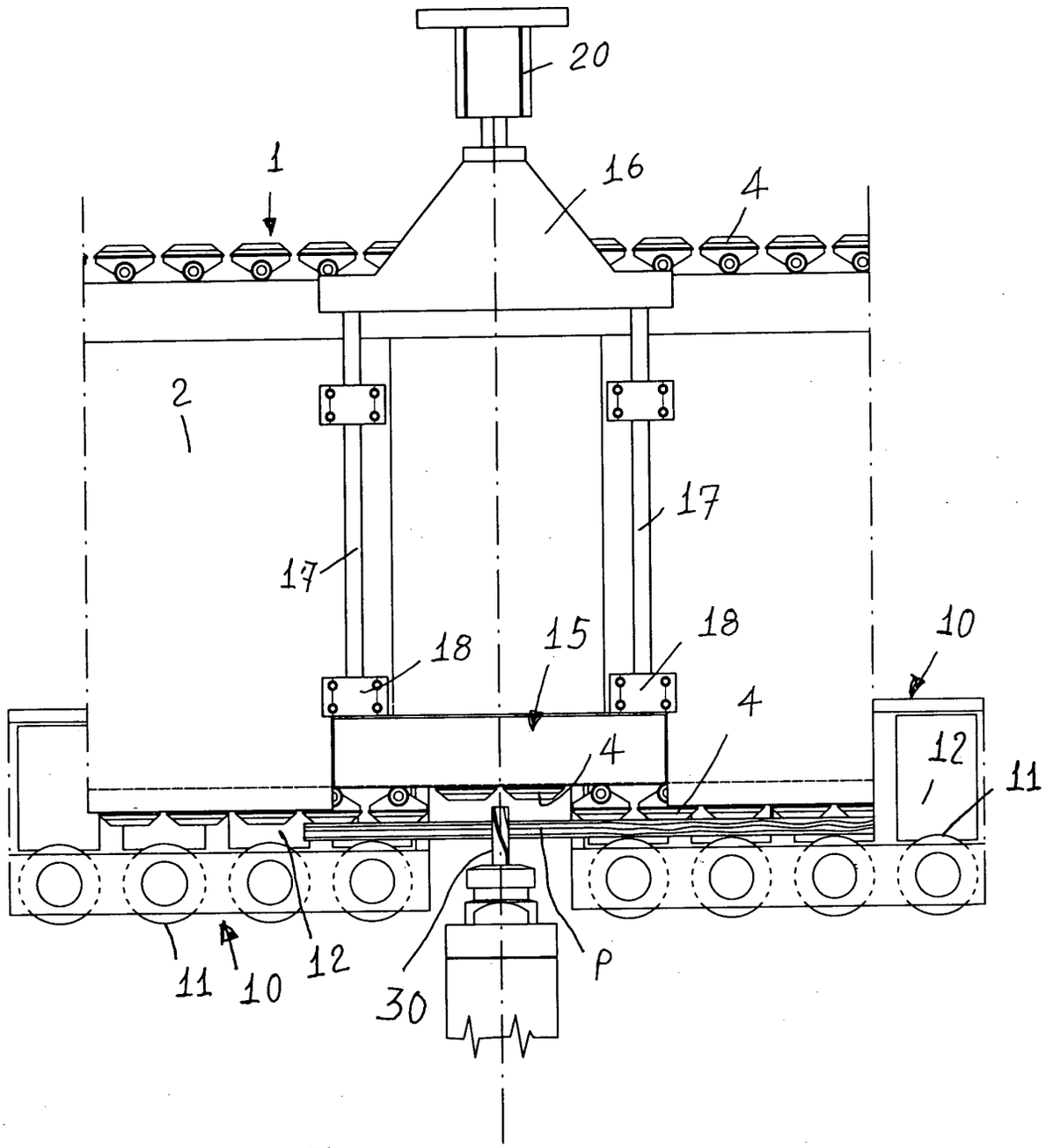

FIG. 3

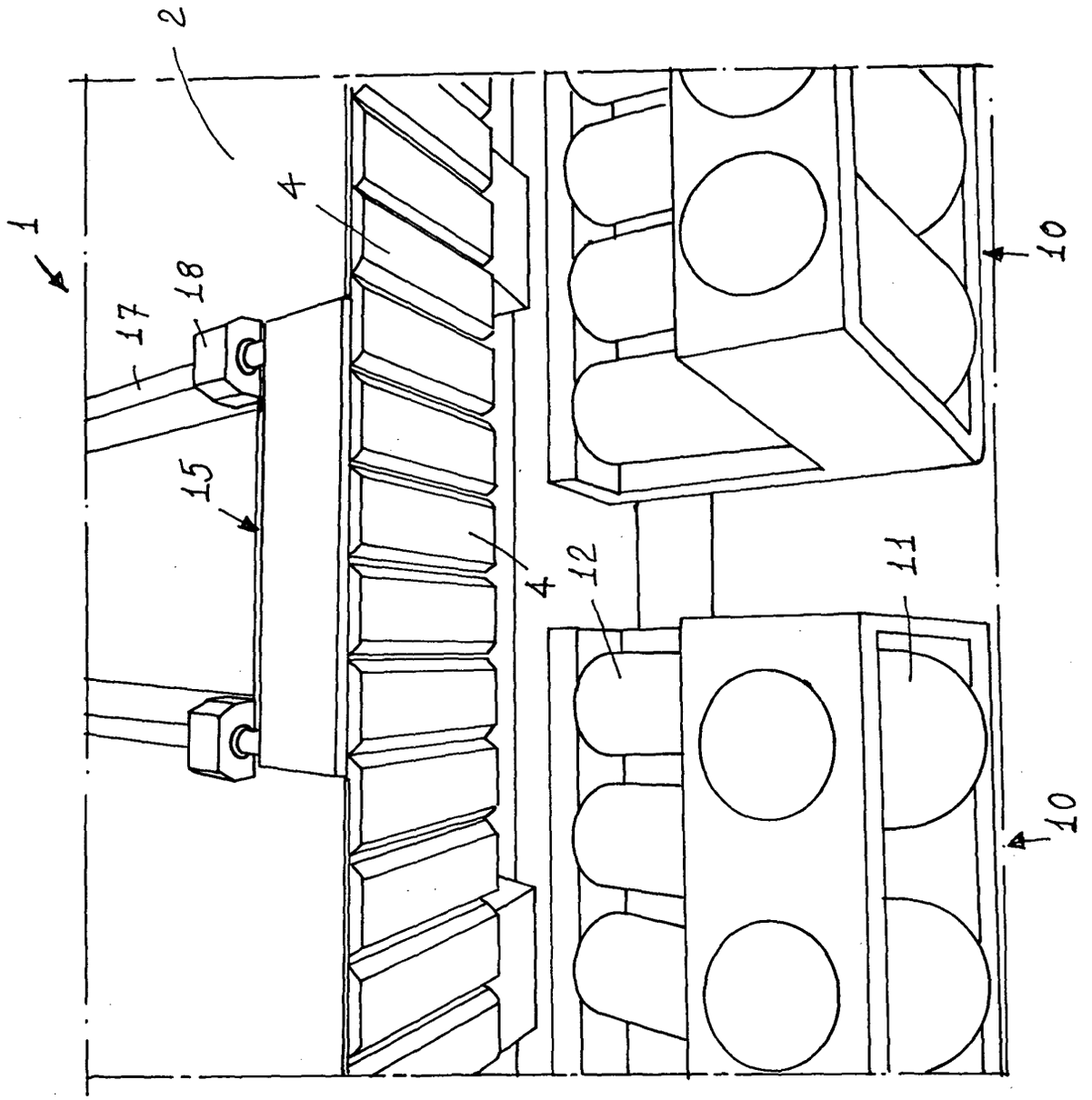

FIG. 4

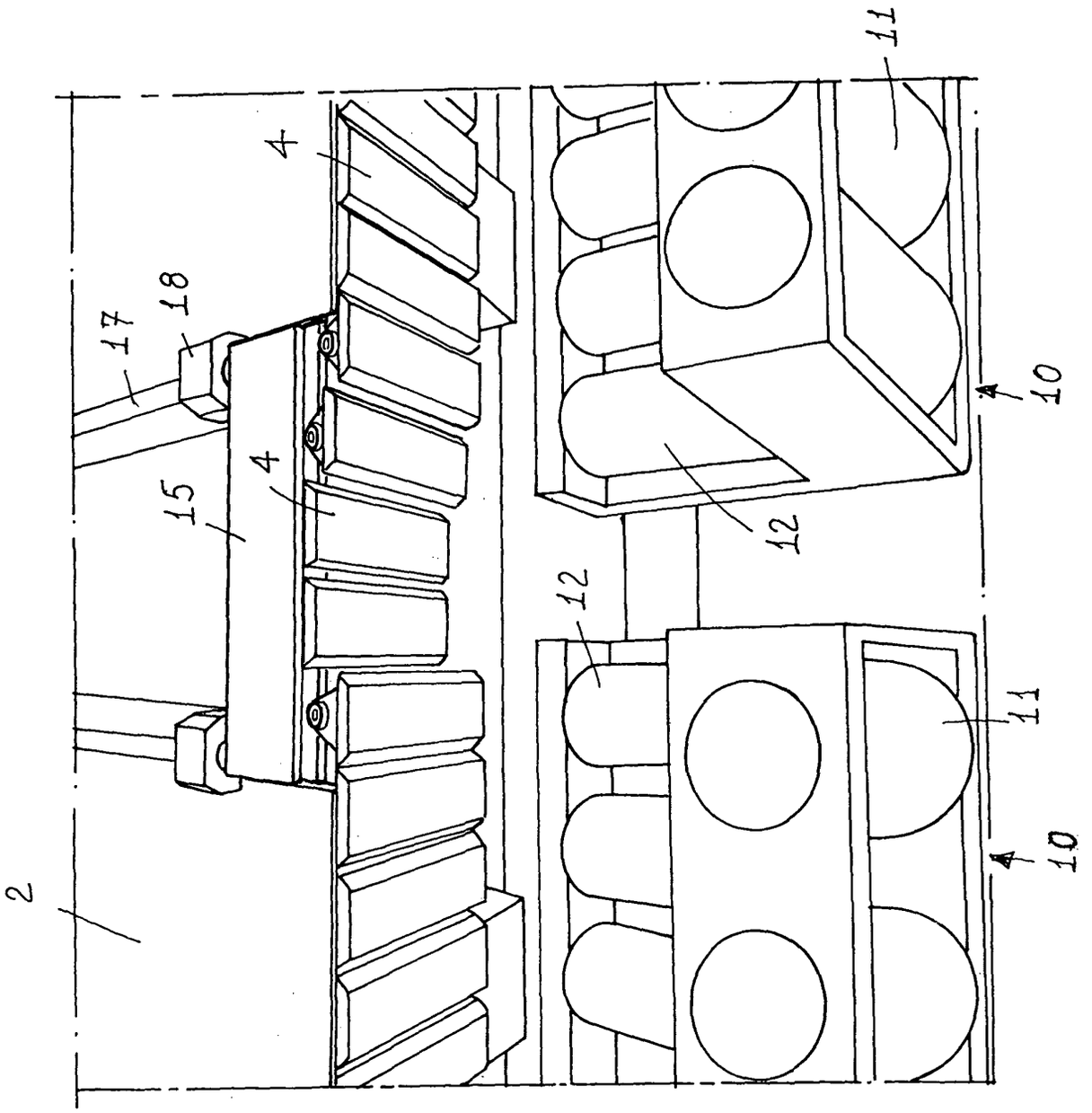

FIG.5

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 00 1408

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	EP 1 172 174 A (RE.M.S.R.L) 16 January 2002 (2002-01-16) * the whole document * -----	1-7	B23Q7/03 B23Q7/05
A	EP 1 207 028 A (RE.M.S.R.L) 22 May 2002 (2002-05-22) * the whole document * -----	1-7	
A	EP 1 155 773 A (RE.M.S.R.L) 21 November 2001 (2001-11-21) * the whole document * -----	1-7	
A	DE 31 43 867 A1 (SIELEMANN,WOLFRAM) 11 May 1983 (1983-05-11) * the whole document * -----	1-7	
A	EP 0 366 200 A (TROMPERT, STEPHANUS FRANCISCUS) 2 May 1990 (1990-05-02) * the whole document * -----	1-7	
A	EP 1 375 096 A (HEIAN CORPORATION) 2 January 2004 (2004-01-02) * the whole document * -----	1-7	TECHNICAL FIELDS SEARCHED (Int.Cl.7) B23Q

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	3 May 2005	Müller, A

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

1

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 05 00 1408

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

03-05-2005

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1172174 A	16-01-2002	IT MI20001496 A1	03-01-2002
		DE 60100119 D1	17-04-2003
		DE 60100119 T2	08-01-2004
		EP 1172174 A1	16-01-2002
		ES 2194001 T3	16-11-2003
		US 2002001511 A1	03-01-2002
EP 1207028 A	22-05-2002	IT MI20002484 A1	17-05-2002
		EP 1207028 A2	22-05-2002
		US 2002127069 A1	12-09-2002
EP 1155773 A	21-11-2001	IT MI20001066 A1	15-11-2001
		DE 60100303 D1	03-07-2003
		DE 60100303 T2	01-04-2004
		EP 1155773 A1	21-11-2001
		ES 2198376 T3	01-02-2004
		US 2001045345 A1	29-11-2001
DE 3143867 A1	11-05-1983	NONE	
EP 0366200 A	02-05-1990	NL 8802615 A	16-05-1990
		EP 0366200 A1	02-05-1990
EP 1375096 A	02-01-2004	JP 2004025448 A	29-01-2004
		EP 1375096 A1	02-01-2004
		US 2003234160 A1	25-12-2003

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82